

Interagency Breast Cancer and Environmental Research Coordinating Committee

**Department of Health and Human Services
National Institutes of Health
National Institute of Environmental Health Sciences
National Cancer Institute**

**Minutes of the Interagency Breast Cancer and Environmental Research Coordinating
Committee Meeting**

September 26-27, 2011

The Interagency Breast Cancer and Environmental Research Coordinating Committee (IBCERCC) convened its third in-person meeting on September 26, 2011 at the Rodbell Auditorium at NIEHS in Research Triangle Park, North Carolina. The committee chair is Michele Forman, PhD, of the University of Texas MD Anderson Cancer Center.

The meeting was open to the public on September 26, 2011 from 8:30 a.m. to 5:30 p.m. and on September 27, 2011 from 8:30 a.m. to 3:00 p.m. The agenda for September 27, 2011 included a 15-minute session devoted to public comment. Notice of the meeting was published in the *Federal Register*.

The IBCERCC is a congressionally mandated body established by the National Institute of Environmental Health Sciences (NIEHS), in collaboration with the National Cancer Institute (NCI). This Committee is comprised of 19 voting members, including representatives of Federal agencies; non-federal scientists, physicians, and other health professionals from clinical, basic, and public health sciences; and advocates for individuals with breast cancer. The Committee encompasses three subcommittees, each charged with the preparation of one section of the Committee's final product, a report to the Secretary of the Department of Health and Human Services: the State-of-the-Science subcommittee (chaired by Dr. Forman), the Research Process subcommittee (chaired by Dr. Gould), and the Research Translation, Dissemination, and Policy Implications subcommittee (chaired by Ms. Rizzo).

Members Present

Christine Ambrosone, PhD
Janice Barlow, PNP (by telephone)
Beverly Canin
Ysabel Duron
Suzanne Fenton, PhD
Michele Forman, PhD, MS
Michael Gould, PhD
Sandra Haslam, PhD
Ronda Henry-Tillman, MD (by telephone)
Karen J. Miller

Laura Nikolaidis, MS
Marcus Plescia, MD

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Kenneth Portier, PhD
Jeanne Rizzo, RN
Gayle Vaday, PhD
Cheryl Walker, PhD
Shelia Zahm, ScD

Ex Officio Members Present

Dale Sandler, PhD
Neeraja Sathyamoorthy, PhD

NIH Staff Present

Linda Birnbaum, PhD, DABT
Jennifer Collins, MR
Gwen Collman, PhD
Caroline Dilworth, PhD
Christie Drew, PhD
Gary Ellison, PhD, MPH
Nonye Harvey, MPH
Christie Kaefer, MBA, RD
Les Reinlib, PhD
Deborah Winn, PhD

Other

Kathy Brown-Huamani
Connie Engel, PhD
Ernie Hood
Ilane Maximo
Mary Moss

I. Welcome

Dr. Linda S. Birnbaum, director of NIEHS and the National Toxicology Program (NTP) welcomed participants to NIEHS and to the third in-person IBCERCC meeting. She introduced the newest member of the panel, Ysabel Duron, founder and executive director of Latinas Contra Cancer, a San Jose, California advocacy group dedicated to education, navigation and support for the underserved Latino population around issues of cancer. Dr. Birnbaum announced that Dr. Vivian Pinn of the NIH Office of Women's Health, who had represented NIH Director Dr. Francis Collins on the committee, has retired, and will be replaced soon by another NIH representative.

II. Opening Remarks and Introductions

Dr. Forman welcomed attendees, and had everyone in the room introduce themselves, as well as the telephone participant who was on the line at that time. She said that the purpose of this

meeting was to synthesize the work done to date by the three subcommittees, identifying gaps in each of the report sections, and beginning to get a sense of how the various elements would come together and coalesce into an integrated document. Threading is the theme of the meeting, weaving together major points to form the report's Executive Summary.

III. Update from the State-of-the-Science Subcommittee

Advances chapter

Dr. Sathyamoorthy updated the Committee on the progress of the group working on the Advances chapter of the State-of-the-Science (SoS) Subcommittee portion of the report. The group had sent out a memo to people working in the field, such as epidemiologists, clinicians, and basic researchers, soliciting their input to list noteworthy breakthroughs in breast cancer prevention, treatment, and diagnosis since the War on Cancer began in 1972. Responses were received from several sources and were collated.

Significant developments in breast cancer diagnosis included:

- Development of screening mammography, resulting in about a 30% reduction in breast cancer mortality
- The Breast Cancer Detection & Demonstration Project determined that high mammographic density is associated with elevated breast cancer risk (1995)
- BRCA₁ and BRCA₂ gene mutations are linked to an increased risk of breast cancer—a finding that helps identify women at increased risk of developing breast cancer (1997)
- Gene expression profiling defines breast cancer into five subtypes, each with its own characteristic molecular signature (2000)

Breakthroughs in breast cancer prevention included:

- Timing of carcinogen exposures influences breast cancer risk (animal studies as well as epidemiological data)
- Identification of modifiable environmental risk factors: alcohol, combined hormone replacement therapy, physical activity and body mass index
- FDA approves tamoxifen to reduce risk of developing breast cancer among women at high risk for the disease, such as those with BRCA₁ or ₂ mutations (1998)
- Study of tamoxifen and raloxifene (STAR) demonstrates that raloxifene is as effective as tamoxifen in reducing risk of invasive breast cancer in postmenopausal women (2006)
- Trial finds exemestane significantly reduces risk of breast cancer in women at increased risk of developing the disease (2011)

Advances in breast cancer treatment included:

- Modifications in surgical procedures reduce risk of surgical morbidity

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- Transition from radical mastectomy to lumpectomy and radiotherapy, reducing extent of surgery and adverse outcomes
- Development of adjuvant therapy, which reduces odds of recurrence and mortality
- Improved radiation therapy using novel imaging techniques allows enhanced dosing to specific locations and reduced risk of irradiation of normal breast tissue
- Presence of estrogen receptor (ER) guides choice of endocrine therapy. Tamoxifen, a drug that blocks ER activity, is approved for the treatment of ER-positive breast cancer (1977).
- Aromatase inhibitors approved for the treatment of ER-positive tumors in postmenopausal women
- Herceptin (trastuzumab), a monoclonal antibody and one of the first of a new generation of targeted therapies is approved for treatment of breast cancers that express the Her2 protein (2005)
- A 21-gene recurrence score model helps in identifying breast cancer recurrence in women with node-negative, ER-positive breast cancer, and predicts the magnitude of chemotherapy benefit (Oncotype Dx) (2004)
- MammaPrint is FDA approved: it is a gene expression-based prognostic test to assess a patient's risk of recurrence and spread (2007)
- Sentinel lymph node biopsy results in fewer complications than axillary lymph node dissection (2010)

Discussion

Ms. Canin asked whether the group had taken potential weaknesses of the individual studies into account. Dr. Sathyamoorthy replied that they had not, but that it was a good suggestion.

Dr. Walker noted that the group had sent out the American Association for Cancer Research (AACR) Cancer Progress Report 2011, and wondered how the group was planning to leverage and incorporate information from it. She also asked how the group planned to return to the theme of the environment and incorporate the influence of environmental factors. Dr. Sathyamoorthy replied that environmental influences would be incorporated. Dr. Forman said that the AACR report would be incorporated into the advances section of the report. Dr. Haslam noted that the legislation had not specifically called for the environment to be included in the advances section of the report, so it was not specifically addressed by the group, as it was not considered to be the purpose of identifying the advances.

Ms. Duron inquired whether the group had broken down advances in terms of breast cancer in women of color. She expressed concern that women of color might not receive the full benefit of the science in the report if they are not teased out sufficiently.

Epidemiology chapter

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Dr. Ambrosone presented an update on the recent activities of the Epidemiology group within the SoS Subcommittee. The group has arrived at a draft outline for the chapter based upon the overarching question, “What is known about breast cancer and the environment?” That question generated several sections, which Dr. Ambrosone discussed in detail:

- Accepted risk factors (e.g., age, family history, radiation to the breast, reproductive and hormonal factors, etc.)
- Rare and common genetic variants
- Investigated but inconclusive findings (e.g., diet, tobacco use)
- Effects of heterogeneity on associations (e.g., blurred risk factor effects due to host and tumor heterogeneity, intrinsic tumor subtypes)
- Environmental exposures (assessing review articles for quality, using Brody 2007 as baseline, conducting literature search from 2007 to present)
 - DDE, DDT – no overall associations, may be related to ER status, time of exposure
 - Self-reported pesticide use – no consistent findings
 - Dioxins – inconsistent findings (positive in Seveso)
 - PCB – no consistent associations
 - Appear to be associations when stratified by cytochrome P450 1A1 genotypes
 - Ecological studies suggestive for some air pollutants
 - Three suggestive studies with PAHs and risk, others null
 - Shift work, light at night – suggestive findings
 - Drinking water contaminants – ecological studies, GIS, no consistent increases in risk
- Methodological issues (e.g., exposure assessment, kinetics of exposure, timing of exposure and data collection, etc.)

Discussion

Dr. Gould asked if there were plans to include quantitative data regarding risk in the chapter. Dr. Ambrosone replied that detailed data would be included, particularly in the environmental and occupation risk discussions. Dr. Plescia asked if the group had looked at the issue of radiation exposure, which he said the Dissemination subcommittee had taken a particular interest in. Dr. Forman noted that material regarding radiation exposure and secondary cancers would be included. Ms. Miller wondered about the inclusion of risks and exposures related to epigenetics. Dr. Forman and Dr. Ambrosone replied that that area had not been considered, but should be included. Dr. Portier mentioned that perhaps the decreased incidence of breast cancer since it had been associated with hormone replacement therapy (HRT) should be discussed; Dr. Birnbaum noted that incidence had gone back up since then.

Animal Research chapter

Dr. Fenton updated the Committee on the recent progress made by the group working on the animal research chapter of the SoS section of the report. She summarized the main portions of the draft text the group has prepared, and showed some of the figures and advances and progress that will be listed.

Four pages in the background section of the chapter describe the development of the breast in rodents and in humans, including lifestage-specific susceptibility for cancer risk. There is also a section on mechanisms of cancer development, including mutagenic, DNA-mediated and non-DNA-mediated mechanisms, and how environmental compounds may fit, as well as discussion of the difference between a compound that may alter susceptibility versus a frank carcinogen. The role of nutritional components in cancer risk is also included.

The group has developed a figure that depicts the similarities and differences between rodent and human breast development. Another figure illustrates the morphology of mammary glands in adult rodents and humans, including specimens undergoing lactation and aged specimens. Importantly, the times spent in the stages of development across species will be described. Although they are very different, the ratios are similar.

The chapter goes on to describe the role of rodents as relevant models for humans in breast cancer research, including the history of the area, current models in use, and plusses and minuses of using mice versus rats. Special issues are included, such as carcinogen-induced tumors, strain differences, and of knockout transgenic animals.

Dr. Fenton also delineated the advances and progress in animal research in the field, as contributed by colleagues:

- Localization and characterization of isoforms and roles of mammary estrogen and progesterone receptors
- Identification of environmental agents and carcinogens affecting risk for mammary tumor development
- Use of modified mouse lines to discover genetic and morphological basis underlying susceptibility to tumor development
- Effects of pharmaceuticals for cancer prevention: tamoxifen/raloxifene/aromatase inhibitors
- Protective effect of pregnancy on cancer development
- Comparative anatomy studies (rat/mouse, rodent/human) clarifying similarities and differences between species
- Identification of growth factors critical for mammary growth and development
- Importance of microenvironment for tumor progress (stromal role)
- Definition of non-DNA irradiation effects
- Understanding of mammary stem cell regeneration/proliferation
- Modifying role of fat metabolism and inflammation in tumor risk

Discussion

Dr. Collman suggested that the development of the DMBA model for chemical carcinogenesis be included as a significant advance in the field. Dr. Fenton said there was an entire section in the Background portion of the chapter in which the use of animal models is discussed in detail, including the DMBA model.

Dr. Walker inquired whether the group was capturing the data on early life exposures and later risk of breast cancer. Dr. Fenton replied that there is in fact a specific section on that topic included.

Research Needs chapter

Subcommittee chair Dr. Forman summarized the work of the SoS documenting research needs in the breast cancer and the environment field. She referred members to the Table 1 handout. The approach taken by the group encompassed identifying relevant research questions, delineating the goals inherent in a given question, identifying action items related to the question, and the relevancy of the question for animal and human research, which is depicted by check marks in the Table.

The five critical research questions identified by the group, each with its own associated goals and action items, were:

1. Which environmental exposures impact breast cancer susceptibility or recurrence?
2. When during the life course do the exposures have their (greatest) effects?
3. What are the underlying mechanisms for the effect of the environmental exposures on breast cancer risk or recurrence?
4. Who is at risk for breast cancer from the environmental exposures?
5. How (i.e., at what point of evidence) do we decide that an environmental exposure is associated with breast cancer risk and/or survival and thereby take action?

Discussion

Ms. Rizzo wondered whether the focus on high-risk populations inherent in the material under Question #4 might be too limiting. Dr. Forman replied that that had not been the intention, and that it was a good point.

Dr. Birnbaum asked Dr. Forman to elaborate on the action item for Question #5, “Identify a cross-agency process to determine weight of evidence.” Dr. Forman confirmed that the group was seeking a common nomenclature across agencies, which does not presently exist. Dr. Birnbaum felt that it might be a good question for the Institute of Medicine or the National Academy of Sciences to undertake, and that it would be appropriate to suggest that action in the report.

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Ms. Canin suggested that the term “occurrence” be added to Question #1. Dr. Forman agreed.

Ms. Rizzo asked about the reference to “tracking” in the action items for Question #1. Dr. Forman said that was something they were not planning to delve into in detail, and wondered whether the other subcommittees were going to, noting that this presented a good opportunity to begin the process of determining which committee was working on particular elements, to avoid overlaps and redundancies.

Dr. Walker agreed with Ms. Miller’s earlier reference to epigenetics, and felt that it should be included in the research needs section. Dr. Forman agreed.

Dr. Collman felt that the question of who is at risk for breast cancer from environmental exposures should be broader than simply genotype, incorporating elements such as levels of exposure and socioeconomic factors, for example. Dr. Birnbaum agreed, pointing out that care should be taken not to fall into the trap of focusing on the old dichotomy between things that are genotoxic or not, because susceptibility is going to be variable depending on location, depending on early life exposures altering vulnerability, etc. Dr. Forman agreed, pointing out that there is a large section in the Epidemiology chapter focusing on the importance of early life exposures.

Ms. Nikolaides asked how the needs description would be tied in with what research the federal government is actually funding. Dr. Forman noted that the question led directly into the next section of the meeting—the report from the Research Process (RP) subcommittee.

Dr. Winn suggested adding material regarding duration, dose response and quantities to the section regarding interrelationships. Dr. Forman agreed. Dr. Walker suggested that the appreciation of the importance of non-monotonic dose responses should also be recognized as a major scientific advance in the field.

Dr. Forman asked that any committee members who had comments or suggestions related to the SoS chapters write them down and give them to Dr. Nikolaides for the subcommittee’s review.

IV. Update from the Research Process Subcommittee

Subcommittee chair Dr. Gould introduced the report. He noted that the Research Process (RP) subcommittee was planning to prepare two chapters, one on what federal agencies are involved with breast cancer research, and what part of their funding goes to research on the environmental element of the etiology of breast cancer; the other chapter will include coding methods and suggested tools, including a proposed framework. He asked that the other committee members help the RP by suggesting recommendations to cover some of the emerging gaps, based on the material the RP would present. He asked that written comments be passed along to Ms. Collins.

RP Chapter One: Federal Funding of Breast Cancer and Environmental Factors Research

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Dr. Vaday presented the draft contents of the RP's first chapter to the committee, which focuses on the who, the what, and the how of federal agency funding for breast cancer and the environment research.

The chapter begins (Section 1.1) with a description of the federal agencies investing in *breast cancer research*, including the NIH, the Department of Defense (DoD), the Centers for Disease Control and Prevention (CDC), and other agencies such as the EPA. It continues (Section 1.2) with a more focused look at those agencies' investments in research on breast cancer and environmental factors, including a brief description of the Common Scientific Outline (CSO) used for coding, figures depicting the agencies' portfolios by CSO categories, and data on what the agencies have funded in breast cancer and the environment research. Section 1.3 describes intra- or interagency programs invested in breast cancer and the environment research, including the BCERCs, the BCERP, the Sister Study, the Long Island Breast Cancer Study, and others. The chapter concludes (Section 1.4) with the committee's assessment of the extent of breast cancer and the environment funding coverage (including gaps and overlaps), the benefits and constraints of current peer review and selection processes and of current federal funding models.

Discussion

Dr. Zahm asked whether intramural research on breast cancer was being considered in the subcommittee's portfolio analysis, noting that it represented a significant slice of the pie chart shown in the subcommittee's draft handout, which depicted Distribution of NIH Breast Cancer Research by Major Funding Category: FY 2008-2010. She also suggested that the NIEHS/NCI/EPA Agricultural Health Study be added to the draft as a prime example of interagency research.

Dr. Ambrosone commented that although it was understandable that the subcommittee had only considered breast cancer and the environment research dating from 2008 to today, there was much research in the area, particularly in the 1990s, that should be captured in the analysis. She also wondered if the analysis had adequately considered research falling under the broader definition of the environment (as being more than simply chemical exposures) being used by the committee. Dr. Vaday replied that in addition to the CSO codes used, the DoD has a classification system that incorporates other areas such as behavioral and psychosocial research, and that studies were included from that perspective. She added that to incorporate research from prior to 2008 would not be difficult for DoD, but would be quite difficult for NIH. Dr. Winn noted that there must be cross-talk between the CRISP and RePORT databases that could help. Dr. Collman said that there were several related RFPs from the 1990s, which she volunteered to assemble and pass along to the subcommittee. Dr. Gould said that semi-quantitative or qualitative descriptions of pre-2008 research, even from World War II and beyond, should be included, citing radiation research as an example of a related field that has evolved over time.

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Dr. Sandler felt that some of the other relevant interagency programs (e.g., exposure measurement technologies) should be captured to arrive at a comprehensive qualitative assessment of current research in the area, without necessarily broadening the quantitative portfolio analysis. Dr. Birnbaum agreed, and recommended that some other federal agencies such as the USGS, USDA, and NOAA be included in the analysis.

Ms. Duron suggested inclusion of an analysis of what percentage of the funding and how much money altogether had gone to research on women of color and ethnic populations, as well as a similar analysis of funding levels for minority researchers. Dr. Birnbaum agreed that research involving ethnic and minority communities should be explicitly addressed in each chapter of the report.

Dr. Plescia pointed out that the CDC and the National Center for Environmental Health conduct much breast cancer research, which should be included in the analysis. He offered to provide further information to the subcommittee.

Dr. Walker felt that there with the work of the two committees, there was a good opportunity to align the research and knowledge gaps with the cataloguing of where money was being spent. She said that might be a good way to determine whether progress is not being made because money is not being expended in certain areas, or whether much money is being spent with little progress to show for it.

RP Chapter Two: Developing a Strategic Plan for Breast Cancer and Environmental Factors Research

Dr. Portier described the draft contents of the second RP chapter to the committee. It currently consists of:

RP-2.1 Introduction

RP-2.2 Recommendation: Develop a Research Framework for Breast Cancer

RP-2.3 Recommendation: Expand Current Research Coding

RP-2.4 Recommendation: Foster Funding and Environments that Support Innovative Research in Breast Cancer and Environmental Factors

RP-2.5 Recommendation: Develop Research Programs that Focus on Key Challenges

RP-2.6 Appendix: Current Research Innovation Programs

Dr. Portier said that one of the goals for the committee was to answer the question Dr. Walker had just asked about lack of progress and its association with expenditures, which led them to focus on identifying gaps, which is difficult without knowledge of the full picture. He noted, for example, that the CSO is very shallow as a tool for comprehensively assessing research in the area.

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Dr. Portier walked the committee through the chapter outline, pointing out that the Appendix is now large, with pertinent material having been moved into it to maintain page limits in the chapter. The framework proposed in RP-2.2 is one of the subcommittee's key concepts:

- The framework for breast cancer and environmental factors research is a basic conceptual structure designed to support better understanding and growth in knowledge.
- The framework is viewed as a network consisting of nodes and links that describes the functional relationships between states and the rates at which changes in state value occur.

He described three versions of visualizations of the framework idea, which would envelope existing knowledge and allow more appropriate, incisive coding of research (likening the idea to the Dewey Decimal System). He said that ultimately the recommendation would be to form a panel (akin to the National Academy of Sciences) that would be charged with developing the framework.

Regarding RP-2.3, the recommendation involves expanding current research coding to allow coding to the framework, which would help delineate gaps in funding. It would be more detailed than the CSO and more directed than MeSH keywords. Details about the proposed coding remain to be determined.

RP-2.4 addresses the key concept of innovation, including recognition of current models for fostering innovative research and justification for recommendation that federal funding of such programs be expanded. RP-2.5, which focuses on the development of research programs that focus on key challenges, includes recommendations on mixtures research, a life course approach to risk assessment, and the importance of communicating environmental risks to the public. Dr. Portier felt that the SoS subcommittee would likely add to those recommendations.

Discussion

Dr. Gould elaborated on the framework, pointing out that the subcommittee envisions interactive features, such as being able to click on a particular box to access information about specific funding and publications, for example. He pointed out that the subcommittee is also recommending that a larger, interagency working group be established.

Dr. Forman asked how an updated reviewer selection process would help to foster more innovative research, and felt that that question should be integrated within the chapters. Dr. Birnbaum mentioned that NIEHS is looking at the CSR peer review system again, now that a new acting director is in place.

Dr. Fenton expressed a desire to see life stage and prevention referred to more prominently in the RP chapters. Dr. Winn pointed out that the chapters appear to focus on investigator-initiated programs, and suggested that they should also include material on infrastructure-building efforts.

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Dr. Gould said that one of the issues the subcommittee wished to raise in the current meeting was whether to include the committee's specific recommendations for what programs should be funding in breast cancer and the environment research in the RP chapter, or the SoS chapter. Up to this point, he said, he's had the RP group avoid making specific funding recommendations, feeling that its role is more about process at this point. Dr. Portier added that infrastructure efforts had been included in an earlier version of the chapter draft, but had been deleted. He said that several of the elements discussants had mentioned were in the subcommittee's thinking, but need to be integrated into the framework itself.

Dr. Walker felt that infrastructure needed to be put back into the chapter, along with material leveraging The Cancer Genome Atlas (TCGA).

Ms. Rizzo asked about the role of programmatic scores in funding grants, and how the need for innovation fits with that process. Drs. Birnbaum and Vaday described how programmatic scores are involved in funding decisions at their respective agencies.

Dr. Haslam noted that there did not appear to be inclusion in the framework matrices of psychosocial or socioeconomic issues. Dr. Gould reiterated that the task of putting together the entire framework was yet to come, and that a comprehensive, all-inclusive matrix had not been the goal of the subcommittee. Dr. Portier added that health disparities was included in a more current version. He said that the elements endorsed by Dr. Haslam were complicated in that they affect individuals and populations, with social and policy implications all integrated together. Ms. Canin noted that when those elements are in fact put in, there should be clear delineation between disparities and inequities, and both should be addressed.

V. Update from the Research Translation, Dissemination, and Policy Implications Subcommittee

Subcommittee chair Ms. Rizzo briefed the committee on recent progress made by the Research Translation, Dissemination, and Policy Implications (RTDPI) subcommittee. She noted the addition of Ms. Duron to the subcommittee, and the contributions of Jenny Collins and Christie Kaefer, as well as contract writer Dr. Connie Engel. The subcommittee has been reorganized into three teams, covering 1) Research Translation, 2) Policy Implications, and 3) Research Dissemination/Communication. She reported that the full subcommittee had met in three 3-hour conference calls since the last full committee meeting, along with "incalculable" informal team collaborations. The group has reviewed close to 200 publications thus far. For this meeting, the subcommittee's product is three draft chapters with references and appendices, along with PowerPoint presentations by each team.

She identified "choppportunities"—challenges and opportunities faced by the subcommittee. Members found working in teams to be productive, but it was challenging that all of the pieces were not yet harmonized. In terms of content, she said the subcommittee had discussed at length the differences between translational research, research translation, and implementation of

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research. Dissemination strategies vs. communication strategies at the micro and macro levels were also a topic of much discussion, as was the specificity of recommendations in all sections related to breast cancer and the environment. The RTDPI subcommittee sees breast cancer prevention as the overarching goal and principles of disease prevention should be threaded throughout the IBCERCC report. Other key themes which have emerged include the need for innovative communication strategies, as well as a recommendation for funding agencies to include research translation, communication, and dissemination as a component of Funding Opportunity Announcements and the overall research process.

Ms. Rizzo reported that RTDPI was seeking full committee input on the scope and specificity of policy implications, boundaries between the RTDPI and Research Process subcommittees, and the voice and audiences for the report itself.

Research Translation chapter

Ms. Canin reported on progress by the team working on the Research Translation chapter. She noted that there was considerable overlap in the different sections, both with the RTDPI subcommittee and with the other subcommittees. Although some repetition is acceptable, she said, much work remains to make the report coordinated and seamless in terms of the overlapping content. Ms. Canin recommended that the precautionary principle be highlighted and emphasized throughout the report.

She showed the current working definition of Research Translation. The only difference between it and the one seen previously was the change in the last phrase of the definition to “research translation approach,” as opposed to the prior “translational research approach.” The structure of the document will highlight the literature defining research translation, explore and address gaps in research translation, and describe notable programs that have integrated research translation. Research translation theories to be described include the conduct of basic science (including translational models), the application of scientific discoveries in the clinic, and the creation of tools to put discoveries to use for the greatest impact on public health practice and policies.

Table 1 of the chapter depicts research translation stages and applications to breast cancer and the environment, including content from two recent studies (Green *et al*, 2009; Khoury *et al*, 2010). The team identified several barriers to translating research, including:

- Insufficient recognition of research translation as an imperative
- Rules that slow publication
- Requirement that data be published before it is considered to be of value for policy and practice
- Insufficient use of the community-based participatory research (CBPR) process that engage advocates

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- Insufficient pathways of communication within and between agencies and for communication with stakeholders

Several of these barriers emerged as important considerations throughout the committee's deliberations and discussions

The chapter continues with content describing noteworthy breast cancer and the environment programs that have incorporated translation, which could serve as models for future programs. They include the Breast Cancer and the Environment Research Centers (BCERC)/Breast Cancer and the Environment Research Program (BCERP), the California Breast Cancer Research Program (CBCRP) and the Pediatric Environmental Health Specialty Units (PEHSU), which is a program of the Association of Occupational and Environmental Clinics.

Research translation recommendations include:

- Policies at funding agencies:
 - Formal structures for community participation and power sharing
 - A requirement for a research translational component in requests for proposals
 - Funding to train advocates for inclusion in research projects, grant reviews, research translation, communication and dissemination
 - Funding for adequate compensation for advocate and community consultants
 - Training to enhance basic scientists' knowledge of and need for science and research translation
- Formation of an inter-agency collaborative to provide:
 - Data sharing that provides easy access to the latest information
 - Better coordination and expedition of processes for regulation
 - Effective infrastructure to translate, communicate, and disseminate research findings:
 - To agencies with regulatory jurisdiction
 - To the external network of advocates and stakeholders

Chapter appendices related to research translation include lists of model programs and major non-governmental funders of breast cancer research, focusing on their potential for research translation.

Remaining work that needs to be done by the Research Translation team includes:

- Clarifying overlap between research dissemination and research translation,
- Demystifying the point of entry into the research translation process,
- Addressing the barriers to adding advocates to the research process, and
- Identifying innovative programming schemes.

Discussion

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Dr. Haslam pointed out that there seems to be “another pathway” for dissemination of research information, because the public is constantly bombarded with it. It is often brief, inaccurate, and insufficient. “Where do we come in to this huge existing translational mechanism?” she asked.

Ms. Janice Barlow stated there are many barriers to research translation and she does not think the solution is including and training advocates (although this would enhance translation and dissemination). There is a rich literature on research translation and she would like a larger section on barriers and information about model programs.

Dr. Haslam added that the report is currently not focusing on some the large current mechanisms that are reaching the public. Ms. Rizzo pointed out that the Communications section of the subcommittee’s presentation would address the points Dr. Haslam brought up.

Dr. Walker suggested adding a reference to the NIEHS Centers of Excellence as another model program. She also suggested referring to “incentivizing” research translation rather than requiring it.

Dr. Michele Forman commented that the media often presents the clinical side of science and not the public health side.

Dr. Birnbaum, Ms. Canin and Ms. Rizzo discussed the challenge of how to clearly distinguish in the report *research translation* from *translational research*, which, although related, are obviously different. There is not always a linear progress from $T_0 - T_4$ sometimes it is possible to go directly from basic science to clinical impact. Ms. Rizzo said the subcommittee is still struggling with how to most effectively communicate the distinctions between translational research and research translation.

Research Dissemination and Communication chapter

Ms. Duron briefed the committee on the draft chapter. It begins with definitions of research dissemination, health communication, and health literacy. The balance of the chapter is devoted to narrative discussion of dissemination pathways, communication strategies, and recommendations.

Ms. Duron emphasized that in addition to the definition for “translation” provided earlier, it can also refer to the translation of information between Spanish and English, ensuring concepts are fully portrayed and not lost in interpretation. In terms of communication strategies (whether it is focused within government agencies, between agencies, or to the public, it is important to be conscious of who you are trying to reach, what action you want them to take, when, where, why, and how and consider of varying levels of health literacy. This is important to the IBCERCC because it is not dealing with “basic health information” and we need to think about what we want the report to do. Although the report is going to the Secretary, HHS, Ms. Duron also thinks the IBCERCC should be helping the public to understand the issues being presented.

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In the introduction, a framework is presented, based upon the principle that research dissemination does not start or stop with the publication of scientific data, but must begin well before publication. The interagency ecosystem should focus on design, development and implementation of effective communication.

A variety of practices related to research dissemination and communication that the funding agencies should incorporate are presented in the chapter, addressing concerns related to advocates, research stakeholders, multi-ethnic and linguistic communities and grassroots networks, and other vulnerable populations. Methods should engage all aspects of media, and strategies should aim to reach community-based experts in health promotion and knowledge distribution.

Findings should reach other researchers, staff at research, regulatory and public health agencies, policymakers, advocates, media and the public through the variety of dissemination pathways discussed in the chapter.

Several recommendations are included:

- Federal agencies must establish an inter-agency collaborative that updates the research findings on breast cancer and the environment.
- The materials in this report can serve as the starting point for this review, and should be updated quarterly as part of an ongoing review process across agencies.
- This collaborative must work to translate and disseminate information in this report.
- This report will serve as the beginning of an ongoing process that prioritizes communications to stakeholders.
- This inter-agency collaborative needs to provide leadership in translating and communicating scientific knowledge on the role of the environment in breast cancer by creating a communication toolkit specifically focused on breast cancer and the environment.
- This process must include advocates at the onset from diverse socioeconomic, cultural and linguistic groups to attain the best possible outreach to all stakeholders and constituents.
- Expand approaches/methods for getting research findings and conclusions from the body of research to other researchers, staff at research, regulatory and public health agencies, policymakers, advocates, media and the public.

Ms. Duron acknowledged the importance of training scientists to talk to scientists from other disciplines, decision-makers, advocates, the media, and the public. Dissemination should engage all aspects of media: ethnic, Spanish-speaking, and social media. In reference to the media, they play a critical role in communication, although they are not science experts, because they can communicate information in a way that keeps everyone talking. Ms. Duron has noticed the apprehension of scientists and physicians to communicate their research and findings to the media, but she believes they never should they miss the opportunity to tell the real story so the

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truth is not misconstrued. Additionally, promotores and other community health workers who are well-trained have the ability to support information dissemination with a multitude of communities.

Multiple disciplines, especially journalism, are starting to address the gaps in communicating science. Filtering information can be both protective and detrimental to communities, so as the report is created, consideration must be given to who filters information and how communities may protect themselves from “over filtering.”

Work remaining on the chapter involves identifying overlaps, integrating findings from the other subcommittees, harmonizing the chapter with the others, and identifying whether recommendations are presented chapter-by-chapter, section-by-section, or as part of the whole report.

Discussion

Dr. Ronda Henry-Tilman stated that health care providers and researchers need to communicate their findings but training is also needed for the media on cancer issues. All minority media have associations and their own training, but often there are not enough experts available for them to work with.

Dr. Gould expressed concern regarding the issue of filtering. Using the breast cancer screening guidelines controversy as an example, he said there must be a central way to filter information responsibly. The question, he said, is who does the filtering and what is the quality control involved? Ms. Duron agreed that those are important questions. She said that it is important to ensure that specific appropriate groups have been exposed to the information and trained in it, recognizing the impact in their spheres of influence. Dr. Portier suggested that the United States Department of Agriculture’s Cooperative Extension service would be an excellent model for the type of dissemination being discussed.

Policy Matters chapter

Dr. Zahm reported progress on the policy chapter to the committee. Defining the purpose of the chapter, she stated that “to effectively prevent, diagnose, or treat breast cancer, research and its results must be tied to programs at the federal, state, and local level to translate and disseminate results and to implement regulations or other actions that address systemic and population-based issues. There are changes needed that are more systemic than individual choice. The main chapter highlights general themes for major policy areas, while the group has also prepared an appendix that includes an annotated bibliography of several reports addressing weaknesses of current environmental policies and regulations.

The chapter has been divided into seven major policy areas that the group thinks are critical for breast cancer and the environment. Each section includes a variety of specific, related recommendations, described below.

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- Testing environmental exposures
 - High throughput testing methods
 - More consideration of mixtures and combinations
 - Prioritization should take into account
 - Activity at hormone receptors
 - Tissue changes, e.g., altered mammary gland development
 - Susceptibility factors, e.g., early puberty
 - Personal care product
- Biologic and environmental monitoring
 - Easier access to data stratified by geographic location (e.g. “fenceline communities” near industrial sites), occupation, etc.
 - Exposures across the life course
 - Population subgroup representation
 - Targeting of “fenceline” communities
- Risk assessment
 - Better science base for safety factors
 - More consideration of age, life stage, medical conditions & treatments, genetic differences in metabolism & repair
 - Multiple exposures
 - Nonlinear dose-response relationships
 - Epigenetics
 - Methods for using epidemiologic data

Note: Dr. Zahm requested input on scientific needs related to risk assessment from the other subcommittees.

- Research process, priority setting, and funding
 - (to include elements from the other chapters)
- Community participation
 - Formal structure for participation in research
 - Power sharing
 - Resources for training
 - Compensation for community consultants
 - Multidirectional model for communication efforts
- Regulation of environmental exposures
 - Reform Toxic Substances Control Act (TSCA)
 - Extend reform to Food and Drug Administration (FDA), Consumer Product Safety Commission (CPSC), Nuclear Regulatory Commission (NRC), and the Environmental Protection Agency (EPA)
 - Consider mixtures and multiple sources of exposures
 - Cumulative impact of multiple exposures on subgroups
 - Timing of exposure over life course

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- Public access to information on source, use, and discharge of commercial products, including proprietary constituents
 - Precautionary principle
- Interagency coordination and collaboration

Discussion

Ms. Canin pointed out it is important to be clear about the differences between “filtering” and “interpreting” information. Dr. Zahm wondered whether there might be different approaches based upon whether the information in question was medical (such as screening) versus an environmental hazard.

Dr. Walker objected to the narrow focus for the term “personal care products,” suggesting that perhaps it would be more appropriate to describe “individually modifiable exposures,” which would be more expansive.

Dr. Portier highlighted the term “targeted” in both the dissemination and policy chapters as being a key concept. He said that the appropriate perspective on risk is missing in current forms of dissemination and policy discussions. For example, there are 62,000 unscreened chemicals at present, but at least 50,000 are used in such small quantities they would not represent a risk to public health.

Dr. Birnbaum said she was astounded and excited about how much work had been accomplished by the committee since the last meeting in May. She wished to make three rather overarching points. First, she said the committee should be explicit in defining the Precautionary Principle in the context of its use in the report. Second, it is important to note in the report that breast cancer is not just about women—that men are also affected by the disease and should be involved with the issue. Third, she felt that in terms of the report, the whole must be more than the sum of the parts.

Dr. Forman asked that the committee compile themes and threads, both encompassing the scientific and technical, and the process and formatting of the report itself.

Some of the themes mentioned included:

- Precautionary Principle
- Life stage
- Framework (“seeing the big picture”)
- Interagency collaboration
- Multidisciplinary
- Peer Review
- Advocate involvement (beyond just outreach)
- Breast cancer prevention

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- Literacy
- Fenceline communities
- Mixtures
- Complexity
- Environment (broad definition)
- Gene-environment interaction
- Built environment
- Basic science informing epidemiology (and vice versa)
- Environmental factors that affect susceptibility
- Differential susceptibility based on history and ethnicity
- Bench-to-public health
- Validation of exposure and outcome
- *In vitro* testing that identifies signaling pathways
- Breast cancer recurrence and progression
- Cultural and linguistic appropriateness, competence, and sensitivity
- Innovation
- Infrastructure
- Transgenerational and epigenetics (linked to lifestyle)
- Men
- Gaps in research and translational approaches
- The media

Dr. Haslam and Dr. Forman discussed the need for each of the subcommittee breakout sessions to delineate gaps that need to be addressed by the other groups, and to incorporate material from the other groups' updates into their own chapters. Dr. Gould suggested that part of the breakout sessions be informal working meetings between pairs of subcommittees.

VI. Subcommittee Report Back: Subcommittee Needs, Struggles, Gaps, and Overlaps

Dr. Forman introduced the session by asking each of the subcommittees to update the full committee based on the deliberations in their breakout sessions. She said that the SoS subcommittee had systematically gone through each of its chapters (Advances/Progress, Epidemiology, Animal Research) to consider comments that had been received and to consider additions or deletions.

Dr. Sathyamoorthy reported on the Advances/Progress chapter. One suggestion had been to remove the section on environmental agents that impact breast cancer and treat it as a separate section, keeping the initial section as more general causative agents. Another suggestion was to include what is known about minority populations' increased risk of having more aggressive forms of breast cancer. Ms. Rizzo asked where radiation might be addressed. Dr. Sathyamoorthy said it would be in the section on environmental agents.

Dr. Ambrosone summarized the Epidemiology group's deliberations. She said they realized they needed to add a section on male breast cancer and differences in breast cancer rates and incidence by race and ethnicity. Epigenetics need to be addressed. They still had not decided on whether or where to put a section on exposures and breast cancer outcomes. A section on occupational exposures will be added, including exposures among migrant agricultural workers, including discussion of a paper from the Carolina Breast Cancer Study. Dr. Zahm suggested that when discussing the migrant workers, it would be useful to include the literature showing exposure of their newborn infants to pesticides, as one example of an early life exposure. Dr. Winn suggested adding an item about improvements in palliative care, and improvements in treating metastatic disease. Dr. Collman felt that the four boxes used in the section were good, but that perhaps a fifth box would be useful, enumerating advances related to environmental sciences and breast cancer.

Dr. Haslam reported on the Animal Models section. She noted that the anticipated Institute of Medicine (IOM) report does not address animal models at all, while this group's report discusses them quite a bit, and that their importance should be made very clear in the report. Dr. Walker felt that the characterization of the IOM report was inaccurate. Dr. Gould commented that whether or not the IOM report included animal models, it was important for the IBCERCC report to do so. Dr. Haslam added that the other element the group suggested was to add discussion of non-monotonic dose response to its section.

Regarding the Research Needs section, Dr. Forman related a suggestion to take the key research questions and separate them into their own table, which the group agreed would be a good idea. Also, it was suggested to put the goals in text form, with related action items as tabs underneath that text, but the group felt strongly that it would be better to retain all of that information as one image.

Discussion

Dr. Portier said the Research Process subcommittee wished to see the SoS section add a gap related to exposure measurement, as it is not currently highlighted in that section. Dr. Forman pointed out that there was a write-up in the Epidemiology chapter about exposure assessment in terms of methodologic issues. Dr. Portier said the point had come up in the RP discussion about the Precautionary Principle, and the need to tell the public what substances are being generated and produced into the environment. Dr. Forman asked him to elaborate about where they envisioned this point being made; Dr. Portier replied that it was regulatory, dealing with databases, for understanding how many tons of what chemicals are being generated. Dr. Rizzo said that there were many such data sources already in the report. Dr. Portier said that RP felt there was a research gap there, not just a policy gap. Dr. Forman summarized the point as stating that more databases are needed to understand the environmental agents that are coming out. Citing NHANES as an example, Dr. Portier noted that "we measure a lot of stuff, but how do we know what we should be measuring tomorrow, so we can know what to look for in humans?"

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Ms. Rizzo noted that the issue of confidential business information is one of the challenges in that area, and that that issue is discussed in her section of the report.

Dr. Gould reported on the RP subcommittee's deliberations. His summary contained five points, the first three of which were items the group was discussing recommending. First, they recommend the establishment of a permanent interagency committee, modeled on NIH committees on autism and obesity. They would have budget for a minimal administrative staff, and would be a standing committee with representatives from each of the pertinent agencies as well as representatives of the advocacy and scientific communities. For funding, the agencies would contribute to RFAs, rather than trying to establish an independent research budget for the committee. RP felt that two other working groups were needed: a National Academy-type committee to help work out the proposed framework, and another task force made up of experts to help establish the criteria for weight of evidence that could be fairly and equally applied to a variety of situations and risk factors. The group is in agreement that its proposed framework needed to be reworked to incorporate suggestions emerging from this meeting. He said the group will go back into the 1990s to enumerate the research in breast cancer and the environment from that era.

Discussion

Dr. Zahm asked to hear more about the weight of evidence issue, citing the NTP Report on Carcinogens and IARC as examples of scales in current use. Dr. Gould said that RP proposes a grey scale, as opposed to a black-and-white scale, implying gradations beyond simply yes or no. Dr. Portier added that the idea is to help the proposed committee use the framework to establish priority, so that it would have a working paradigm for how to weigh things and identify gaps, as well as when to reach a decision point. He said it will be important to know where we are on the evidence continuum, and when the threshold has been reached to move to policy and action. Dr. Zahm described the IARC classification system, and Dr. Gould asked her to send a reference for more information.

Dr. Walker said that given the history and intricacies of the issue, the idea that this group would establish a new weight of evidence method focusing solely on breast cancer and the environment "is a non-starter." She proposed instead that research gaps should be monitored for opportunities to invest in research "on the cusp" to gain answers that would directly feed into one of the other groups looking at the issue. She said that morphing the current recommendation into something more along the lines she described might allow it to actually have an impact.

Ms. Rizzo pointed out that in the TSCA reform legislation, there is a section describing how to assess what the chemicals of highest concern are. She suggested that it might be useful to review that material in this committee's context. Dr. Portier said the large number of potential resources like that is one reason his group is proposing the task force, since there are so many different ways to approach the issues and questions. It would be useful, he said, to find a way that speaks

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specifically to breast cancer and environmental factors. He said that more consistency and uniformity would be looked for from the task force—one voice.

Dr. Walker said that finding that one voice was more an exercise in harmonization, and that another way to have an impact would be to identify where the various bodies such as EPA, IARC and NTP might be “missing the boat,” if there is a feeling that the agencies are not accumulating the right types of evidence (e.g., early life exposures).

Dr. Forman summarized the major points of the group working to establish criteria—one, to identify gaps in areas that have not been sufficiently developed, and looking for criteria that can be used for evidence. Dr. Gould noted that the two proposed working groups would give the interagency task force the tools it would need to do its job. Ms. Rizzo asked if the interagency task force, left to its own devices, wouldn’t come up with the other groups it might need to do its job properly. Dr. Gould said they had discussed that question, but rejected that approach due to kinetics—that it would probably take at least two years to organize the task force, during which time the framework could be established and the working groups could be doing their jobs, so that the task force would have the necessary resources in place from its beginning, rather than needing to create them from scratch at that time.

Dr. Plescia reported on the breakout proceedings of the RTDPI subcommittee. He said the group had hoped that the draft materials provided earlier would lend the committee a framework for consideration of translation and dissemination of research on breast cancer and the environment, pulling much material from existing national reports such as the President’s Cancer Panel and the National Conversation on Public Health and Chemical Exposures. RTDPI has worked to flesh out the framework in two areas: discussion of 5 or 6 of the main policy issues (without specific recommendations), and communications, looking at the issues but in that case providing more concrete recommendations. He said the group discussed the fact that some of its material is duplicative of work coming from the other subcommittees, and that work will need to be done to hone some of that, as well as integrating it with the rest of the report. The group is looking for two specific things from the other subcommittees. From RP, there is a need for help to articulate some of the broad issues around research process policies. From SoS, the question arises whether there are specific areas where the research is ready for dissemination and translation, but it’s not happening? And what recommendations regarding translation and dissemination might help with that situation?

Discussion

Dr. Portier asked whether RTDPI sees a necessity for actual policy recommendations in the report, as opposed to simply using policy findings as research program drivers, which are called for in the charge to the committee. Dr. Plescia cited the example of barriers to researchers accomplishing their tasks and the potential impact of policy changes in that area. Examples include testing chemicals, biomonitoring, risk assessment, community participation in the research process, and interagency collaboration (specifically to inform regulation). He added

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that it seemed clear that the committee should be identifying areas where research is being successful, but it is not being translated effectively, and making recommendations to address that issue.

Ms. Miller wondered about the role of public health in the committee's scope and duties. Dr. Portier said the term was never mentioned in the committee's charter. Dr. Forman pointed out that "prevention" was discussed in the charter, leading inevitably to consideration of public health. Dr. Portier said the charter language was actually describing research on prevention, and wondered whether the committee would be exceeding its responsibilities to include recommendations for policy that will impact public health. He asked whether that was in the committee's charge, or if "we're going to have to sneak it in the back door." Dr. Forman said she would interpret the charter's language in the broader sense, leaving room for recommendations concerning public health policy. Ms. Rizzo said that for the most part the six recommendations in the Policy Matters chapter concern policies that supports research and affects the research process.

Ms. Nikolaidis felt that issues such as regulating and monitoring chemicals (which was one of the recommendations Ms. Rizzo had cited) do not address the links between environment and breast cancer, and was concerned that the report could be so broad as to be watered down and lack the desired impact. She hoped the points made would be very powerful on what needs to happen to support research on breast cancer and the environment, rather than just repeating what previous reports said. She wanted to focus on the intent of the legislation for the creation of the panel.

Dr. Collman alluded to the rich history at NCI of research related to tobacco, tobacco policy and trends, and exposure related to tobacco and other things, noting that there is not a similar model for issues such as air pollution or other chemicals or consumer products, and that there is a natural link. She suggested that the lack of such a model should be addressed as a gap or a need in either the SoS or RP sections. Such a model would give surveillance power to monitor changes in breast cancer risk over time.

Dr. Portier reiterated that the policy discussion drives identification of the gaps in research knowledge—that for policymakers to make effective policy, there is research that needs to be done.

Regarding the chemical testing and monitoring, Ms. Nikolaidis asked whether that was being separated out for breast cancer, or would involve all cancers or other diseases as well. She felt the committee's agenda had been overly broadened. Dr. Zahm pointed out that until a chemical is tested, it is not known what cancers it might or might not cause. Thus, to determine which chemicals might be associated with breast cancer, they must be tested, as that cannot be known ahead of time. Ms. Nikolaidis said she was not convinced that such testing was the best way to inform her daughter's generation about how to prevent breast cancer. Dr. Zahm asked her to

elaborate on what would, so as to ensure it was in the report. Ms. Nikolaides replied that that is precisely what the committee needs to figure out, what are the research gaps that describe the 80% of breast cancer not attributable to genetic mutations. Dr. Zahm said that testing chemicals is one way to address the issue. Ms. Nikolaides asked if it would be possible to test 80,000 chemicals? Dr. Zahm replied that of course that would be impossible. Ms. Canin agreed that it would be impractical to think about testing 80,000 chemicals, and that it would not be possible to totally delineate just those compounds that might cause breast cancer, so the appraisal must be broader. She said that the discussion had led her to again think about starting the report with the policy implications section, and that leaving it to the end runs the risk of it dangling and feeling disconnected to the rest of the material. That approach would clearly link policy recommendations to the research and to the intent of the legislation, she said.

Dr. Gould added that no one was suggesting that all 80,000 chemicals be tested. He said that current research and knowledge of breast cancer could be used to focus on a short list of chemicals suspected of causing breast cancer. Dr. Collman disagreed, positing that such an approach would run the risk of there being no new discoveries. She noted that when the breast cancer centers were started, it was not yet known that inflammation was a pathway in breast cancer, and that if only chemicals with hormonal effects had been studied, that emerging new direction might have been missed. She said that both approaches, using prior knowledge while still being open to new ideas, would be ideal. She added that use of the word “testing” may be problematic, and that a better phrase might be “increasing our knowledge on the effects of chemicals or other exposures using a variety of research methodologies,” with testing being just one of many approaches. She recalled that there was language in the legislation that said that the committee was not restricted to only using current knowledge about breast cancer to inform a future research agenda. Thus, other sites and factors in the biology of cancer need not be dismissed for informing recommendations by the committee.

Ms. Miller said she was concerned that the committee could lose sight of the emphasis it had made on bold, innovative approaches. Dr. Forman agreed, and felt that these discussions were quite fruitful in arriving at improved approaches to the issues at hand.

Regarding testing, Dr. Sandler felt that given the state of the biology, it would make sense to conduct testing on mechanisms that make sense for breast cancer.

Ms. Duron noted that there seemed to be many different filters at work in the discussion, and in how individual members interpreted the intent of the legislation. She felt that it was crucial for the committee to arrive at a single message, with the understanding that it would go out to multiple audiences. Dr. Forman said she had made a point to start each of the face-to-face meetings thus far with the legislation, but had assumed (incorrectly) that it was unnecessary this time. So, she planned to start the next morning’s proceedings with review of the language in the legislation.

Regarding the discussion of policy, Dr. Sandler said that policy does in fact have implications for breast cancer risk, so recommendation of research on how policy affects breast cancer risk should be in the report.

VII. Group Discussion: Executive Summary

Beginning the second day's proceedings, Dr. Forman announced that there was a change to the agenda, and the committee would work collectively on the report's Executive Summary first. To establish a baseline for the discussion, she summarized the description of the committee's duties contained in its charter.

Dr. Walker pointed out that the language in the legislation calling for a summary of advances in breast cancer research explicitly mentioned a summary of the environmental etiology in advances, not global advances. Ms. Collins noted that the language Dr. Walker referred to was actually more prominent in the charter, and she read the passage. Dr. Forman felt that some of the confusion had hinged on subtle differences between the language in the charter and in the legislation itself. Dr. Collman said that when the committee was first set up, there was much discussion about some of the vagaries in the legislative language, and that the sentence Ms. Collins referred to had been put in the charter to focus the committee squarely on breast cancer and the environment. That being said, however, she added, it was still not inappropriate to examine some of the overall advances in breast cancer research as well. Dr. Haslam agreed, and found it valuable that the advances section was able to separate etiology advances and show how few they were. Dr. Collman felt that the section as it is currently designed meets both the legislation and the charter.

Dr. Collman commented that in the charter language addressing transdisciplinary research, there is a place for behavioral and social science research that has not been highlighted in the SoS chapters, and that it should be incorporated to encompass the need for several disciplines in progress toward prevention.

Dr. Haslam asked if it was clear for whom the report is being written. Dr. Forman noted that it is specifically being prepared for the Secretary of DHHS, but the point should be discussed further, as it is clear that it will have much more visibility, and that there will be multiple audiences, with public, private, and government groups at least looking at the Executive Summary. Thus, the Executive Summary needs to be understandable, may need to be more graphically oriented than the body of the report, and should contain bold, clear messages. Dr. Walker agreed that it was important to be bold throughout the report, as Dr. Birnbaum had reminded the group earlier, particularly in stating the main messages strongly. Changing the environment as a way of preventing breast cancer should be one of the "big" messages, she added, as should the recommended panel to look at the portfolio on breast cancer and the environment modeled on similar groups associated with autism and obesity.

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Ms. Rizzo added that it was also important to identify the various stakeholders involved in or affected by the research process, and that another bold point for the report or Executive Summary would be the fact that that has not been done.

Adding to the bold messages, Dr. Haslam reiterated the issue of when knowledge is sufficient for change of policy, for action.

Dr. Forman said it was important for the introductory chapter to build a compelling case for moving breast cancer and the environment research forward, and should include quantitative data on lives lost and the contribution of various parts of the environment to breast cancer incidence, mortality, and recurrence. Part of the compelling case is that the environment represents modifiable factors, as opposed to many of the other known risk factors for breast cancer. Also, it is important to point out that modifying environmental risks would confer benefits for other diseases as well.

Ms. Duron noted that a complete picture of the state of the science is not possible until the impacts on communities of color and ethnic communities are understood. She also pointed out that including people from those communities is important to training the next generation of scientists. Discussion ensued about the idea of evaluating training opportunities and programs across the various agencies involved. Dr. Collman pointed out that a comprehensive evaluation of training and targeting particular disciplines would be a major undertaking, and that there are enough recent reports about diversity issues in training to allude to the issue in the report without conducting a large portfolio analysis.

Dr. Collman asked Ms. Duron to draft some outline elements for how the diversity issues she was raising could be dropped into the various chapters of the report.

Ms. Rizzo noted the importance of discussing age of puberty as one impact of some of the modifiable factors. She asked the SoS subcommittee to look at what has been learned about that in the BCERCs. Dr. Forman recommended including data on trends in age at menarche, by ethnicity, along with the potential environmental factors influencing those trends, which if modified could affect them.

Dr. Haslam mentioned that prevention should certainly be included as one of the bold statements that should be included.

Ms. Canin asked whether the committee had ever arrived at a solid definition of the environment. The most recent documentation on that was from May, 2011.

Referring to the SoS section of the report, bearing on the discussion about age of puberty, Dr. Collman wanted to ensure that there would be a literature review section regarding that issue.

Dr. Vaday suggested including a bold message stating that consumers and advocates should be involved in all aspects of breast cancer research development. She asked how the goal to

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“identify the optimal mode of information dissemination” would tie in and integrate with the research itself. Ms. Rizzo said that one model would be to build consideration of communication/dissemination strategies into the process of conducting research, so that there is “a thoughtful process” involved. Citing the controversy over the recent update of breast cancer screening guidelines, she pointed out that “this is a high-impact report, something that is going to have a lot of controversy, a lot of energy, a lot of concern.” She said there should be planning for dissemination prior to the release of the report. Dr. Vaday suggested that the possibility of releasing RFAs should be built into the announcement of the report, including reporting requirements and an external advisory board to oversee funded grants. Dr. Walker suggested that perhaps the communication responsibility should be at a higher level, rather than the individual investigator, resulting in a more consistent message and avoiding the need to “recreate the wheel” at every university or every individual investigator’s level. Dr. Forman asked if she was referring to the interagency panel, and Dr. Walker agreed that it should be the one of the responsibilities of that proposed panel.

Ms. Rizzo was concerned that that idea might exacerbate the problem of lag time between publication and communication. Dr. Walker felt that the timing could be a condition of the research; that there would be a requirement to have the communications strategy planned upon submission of a paper. Dr. Forman added that the interagency panel should be given a heads-up when a particular piece of research is coming, so that those involved with communication would be ready to manage the efforts upon publication or release of the research. Dr. Vaday suggested that such plans be built into the agreement for getting the funding initially, so that researchers are obligated to follow through. Ms. Miller said there had been some discussion in her group about use of the “roadmap” concept to help direct processes, e.g. “a Roadmap to Prevention.”

Dr. Collman noted that there are a couple of models NIH has used for inclusion of public members and community organizations in the development and evaluation of research agendas and research projects. Regarding the discussion of dissemination of research from the point of publication on, she stressed that in the community participatory mode, there is a responsibility to communicate the science through the entire course of the research.

To be bold, Dr. Portier said, dissemination should be continuous, should use social media, and could consist of a weekly update on breast cancer research similar to the CDC’s *MMWR* or other dedicated periodic newsletters, to keep subscribers posted on developments in the field before they are in the newspapers.

Dr. Gould said that one of the issues that slows him and his colleagues in this field down is having to wait for publication before being able to access data. He suggested that a model of data sharing similar to the Human Genome Project be adopted, perhaps as a grant requirement.

Dr. Ambrosone wondered how research in the area could be better directed, citing the Long Island Breast Cancer Study Project (LIBCSP) as an endeavor that perhaps had not yielded a great

deal of significant knowledge. Dr. Collman said that it would be important to change public perceptions about research investments, and that a portfolio analysis of the LIBCSP had shown that 85 published papers had emerged along with a variety of training opportunities, but those results had not been effectively communicated. She recommended that the report talk about some of the long-term investments that have been made in the breast cancer and the environment field and the long-term outcomes that have resulted from them. Dr. Ambrosone reiterated her question regarding how the role of the environment in breast cancer in humans can be investigated. Dr. Collman pointed out that the SoS chapter focuses on that point, with its discussion of the shifting pattern of breast cancer and the environment research and the trajectory of how the science has changed over time. Dr. Portier noted that human exposure measurement in epidemiology remains difficult and a problem that has not yet been solved.

Regarding dissemination, Ms. Canin said another bold message would be to stress the use of innovative technology to get the message out.

Dr. Walker endorsed Ms. Miller's idea about using the "roadmap" concept. She also noted that the idea that environmental elements of breast cancer are modifiable raises the communication issue to an even higher level, to encourage changes in behavior. She asked Dr. Ambrosone to elaborate on the point she had made, wondering whether the concern was making investments with little return. Dr. Ambrosone agreed, and said she was worried that this report might generate more funding for research in the area, much of which may ultimately have little impact. Dr. Walker felt that was "the nature of the beast," but that the peer review system works and sometimes research will pay off and sometimes it won't.

Dr. Winn suggested it might be useful to include a recommendation for research on effective ways to disseminate complicated scientific information.

Dr. Portier reminded the panel that the RP subcommittee is proposing a framework that will improve the efficacy of research funding, generating very directed RFPs.

Dr. Haslam pointed out that epidemiology typically has difficulty proving causality, which returns to the issue of when there is enough information to take action. Dr. Forman agreed.

Dr. Zahm pointed out that the use of the term "roadmap" could be problematic given NIH's prior use of that term.

Ms. Nikolaides agreed with some of Dr. Ambrosone's points, and felt that the report should look at prior research in the field, weigh in on what worked and what didn't, and based on that information, make recommendations for how to go forward with the research. She sensed "a bit of tension on this committee between people who are OK with the status quo and those of us who want to make changes." Dr. Forman said that with everyone present, and the current discussions of bold statements to be included in the Executive Summary, this was the moment to speak to Dr. Walker's concern.

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Dr. Gould felt that the words “accountability” and “responsibility” should be included in the report, in the context of directed research. He also pointed out that “innovation” should be one of the major points in the Executive Summary. Dr. Forman recalled that innovation had been discussed at length at the committee’s last full meeting in May, 2011, and ultimately consensus about the definition had been reached. She also mentioned the point about the pros and cons associated with investigator-initiated research and more directed research, and suggested further discussion of those elements. One basic question is, does the committee want to see both forms of research emerge from the program ideas set forth in the report? Another concerns how to enhance the innovative nature of the research. Dr. Gould said the framework being prepared by the RP subcommittee would provide the tools the committee needs to identify gaps and see how directed research could fill them. He said there are many ways to encourage innovation, but that there should be a few paragraphs in the report talking about how to do so, and that there should be specific funding to foster innovation.

Dr. Collman expressed concern about not hearing any new and different concepts emerging, and asked for some examples of transformative ideas. She mentioned several NIH grant programs specifically designed to encourage innovation and transformative research. She was worried that without some attention to that type of concept, the results of the report would be “same old, same old.” Dr. Walker felt that the problem was not a lack of people doing innovative research in cancer, or of people doing transformative things related to environmental research, but that those two elements are not being put together. She said the existence of the proposed interagency panel set up to encourage this type of research would in itself be transformative, but that it is too early to decide on the make-up of the panel or how it would address funding directed research. Dr. Portier agreed that the framework would be innovative and would drive the research in the desired direction. He said that investigator-driven research might be suited to addressing gaps in the framework itself, proposing solutions as the framework is dynamic and grows and evolves over time.

Dr. Forman discussed a concept called “formative research” that had been used in the National Children’s Study. It came out in the form of 250 funded ideas directed at methods, exposure assessment, and more, some of which were “crazy.” It brought out a series of new possible research arenas in that area that needed to be developed. One year later, they have been distilled down to a fruitful subset. She felt that breast cancer and the environment is in the same type of situation, with a great need for exposure assessments, so such an approach would be good for getting the best and brightest new ideas out, and trying some of them out.

Ms. Rizzo recalled the presentation from an earlier committee meeting regarding the California Breast Cancer Program. That program, with a follow-up, has explored breast cancer and the environment, disparities and prevention. She encouraged examination of the program, which had to differentiate itself from prior efforts in the research portfolio, in that some of the work being discussed had already been done, and there might be much to learn from the California

program. Ms. Miller proposed that there be a provision in RFPs for the “tried-and-true” to work with the “out of the box innovators.”

Dr. Gould endorsed the return of “big pots of money” being given to the institutes for rapid administrative supplements, with or without peer review. He said the current process is too slow, and is an impediment to rapid progress for scientists with ready ideas.

Dr. Walker liked Dr. Forman’s concept about formative ideas, and felt that it should be incorporated into the report. She also echoed Dr. Gould’s sentiments about rapidity, noting that part of the problem is dwindling funding levels. She felt rapid deployment should be addressed to help push the field forward. Dr. Zahm agreed, advocating rapid pay mechanisms as well.

Dr. Forman closed the discussion about the Executive Summary, and asked the committee to turn its attention to the most recent definition of the environment. That text was projected, and members pored over it for several moments.

The committee engaged in substantial wordsmithing of the definition, with several suggestions for additions and deletions. The edited version follows:

The environment includes all of the surroundings of and influences on living organisms.

The complexity of environmental influences on the risk of developing breast cancer highlights the challenges –in conducting research to unravel these relationships. This definition of the environment encompasses a wide range of types of external influences that may contribute to breast cancer risk Exposure to these influences can occur across the life course from periconception through adulthood including transgenerational effects.

The major types of environmental factors include:

- Lifestyle and behavioral factors such as diet, alcohol intake or physical activity
- Exposure to chemical agents such as pesticides and industrial pollutants, consumer products, and medications
- Physical agents such as
 - Radiation from our environment or from medical sources;
 - Metals and other physical substances
- The built environment i.e. physical features of the environment such as walkable neighborhoods that may influence our physical activity levels

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- Biological agents such as bacteria, parasites, and viruses including the microbiome
- Sociocultural influences, such as family, community, psychosocial and social (e.g., socio-economic) and societal factors, that may determine exposures to, the extent of exposure, or ability to ameliorate the impact on chemical, physical, and lifestyle and behavioral factors that influence cancer risk.
- Personal susceptibility factors also affect breast cancer risk. These include our race and ethnicity and genetic and epigenetic make-up; certain genetic factors, such as some genetic variants and regions along our chromosomes have been implicated as well as rarer genetic variants that lead to a higher breast cancer risk as have changes in the epigenome that can modify risk across the life course and across generations. . Many personal susceptibility factors are related to reproductive factors such as age at first birth. Other personal susceptibility factors implicated in breast cancer risk include how well or poorly we metabolize or accumulate chemicals in our bodies as well as certain metabolic and physiologic processes such as inflammation and oxidative stress.

Other important features that are involved in breast cancer risk include:

- Breast cancer is itself a complex disease, and environmental factors may have a variable role in the many different manifestations of this disease
- The influence of human developmental factors such as age of exposure of environmental agents on risk of disease
- Certain groups, such as some racial and ethnic groups, children and the disadvantaged, tend to be more heavily exposed and have higher body burdens than others and such disparities may contribute to disparities in breast cancer risk
- That some environmental factors may lead to a chain of events, such as mutations in genes, that in turn lead to cancer, whereas others may significantly influence the personal susceptibility factors that are intimately involved in influencing the process of carcinogenesis (the steps leading to cancer), such as an environmental chemical that increases inflammation
- That multiple exposures and multiple human body reactions to those exposures are occurring at the same time and over time.

Ms. Duron commented that buy-in from the public regarding the report was going to be necessary. To do this, she said, the report should bring the public along as partners in the process, so that when they are asked to pay the price in terms of budget issues, they will be willing to do so. She suggested that language to that effect be inserted into the report at some

point, particularly the Executive Summary...along the lines of, “this report recognizes that the science is here to serve the public, and it is critical that the public accept its responsibility to partner at different levels, as advocates, as participants in studies, in encouraging the new generation of scientists, particularly from ethnic and minority groups, as community groups, to make sure that leadership recognizes and responds to the public desire to address these issues raised, through supporting policy and funding.”

VIII. Group Discussion: Report Format

Dr. Winn introduced the session, to be followed by Ms. Kaefer and Ms. Brown-Huamani from The Scientific Consulting Group (SCG).

Dr. Winn said that new draft sections of the report could be accepted at any time, and that there would be many iterations going back and forth throughout the fall. She noted that the report will go through NIEHS and NCI clearance processes during the late winter. DOD will also be involved in the clearance process, as well as other Federal agencies involved with the report, such as CDC. She said that the SCG team would assist with the integration process, so the committee members do not need to pay great attention to redundancies or overlaps.

Dr. Forman asked Dr. Winn how modifications would be distributed back to committee members during the iterative process, and how the timing would work. Dr. Winn said that interaction with the SCG people would be taking place with the NIH staff who are subcommittee liaisons. During the higher-level clearance process, communication would come from Dr. Collman, because Dr. Birnbaum has been delegated the ultimate responsibility for the report. At that point, the committee would be functioning as a whole, rather than on the subcommittee level. She added that the NCI Board of Scientific Advisors (BSA) may also be involved. Dr. Walker asked whether that would be for informational purposes, or whether the BSA would be signing off on the report. Dr. Winn replied that the legislation required participation by a member of the BSA (in this case, Dr. Ambrosone), but not BSA approval.

Dr. Winn noted that the NIEHS and NCI Offices of Communication have been in touch and will be preparing a communication plan and timelines associated with the release of the report. That plan will be shared with the committee. It will undoubtedly include the report itself, a press release, a website, and spokespersons from the institutes. Dr. Portier inquired whether there would normally be an FAQ, and Dr. Winn confirmed that that would be part of the plan.

Dr. Walker pointed out that the Institute of Medicine (IOM) breast cancer and the environment report will be coming out in December, and should be factored in with the communication of this report. Dr. Forman said committee members would want an opportunity to review the IOM report, and that this committee would certainly want to be cognizant of the existence of the two reports. She added that the committee would probably want to have a conference call to discuss them in context, to make sure there would be no misinterpretations, and to reflect awareness of the IOM report in its report. Dr. Walker felt that the release of the IOM report will represent a

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“fantastic leveraging opportunity.” Dr. Forman agreed, and said there had already been some communication with IOM on how to maximally leverage the two reports.

Dr. Collman asked if the committee members were aware of any other similar reports that might be expected within the next year or two. None were. Dr. Walker felt that this report might be the last word and the call to action on the topic. Dr. Plescia mentioned that CDC has convened a federal advisory committee on breast cancer and young women and they may want to refer to IBCERCC report. Dr. Collman pointed out that part of the dissemination plan for this report would be to send it to and interact with boards such as the CDC’s, as well as other agencies and other outside groups. Ms. Rizzo suggested that the committee be attentive to studies that may be in the works currently. Dr. Forman agreed, and said there was a plan for being sure to incorporate the latest research in the report. Ms. Rizzo said that committee members might solicit input from their respective listservs.

Dr. Winn suggested it was time to start thinking about having other reviewers look at the report once it is complete. Dr. Ambrosone felt that was a good idea.

Dr. Winn introduced Ms. Kaefer, who was to describe the process of working with the contract editor from SCG. Ms. Kaefer described that process at length, noting that SCG would be of great help in both editorial review and formatting of the report. She said that Ms. Brown-Huamani would be available for limited writing assistance, but would be more focused on providing transitions and sidebar pieces for the report, as well as ensuring that the report’s narrative reads as one voice, and editing and proofreading of the report.

Ms. Rizzo asked if there was a plan to design a logo for the report. The committee discussed various aspects of that question at length. Several members endorsed the idea, particularly given the committee’s unwieldy acronym. Dr. Collman cautioned that it might take a long time to arrive at a format, and that the committee should focus on delivering a finished product to the Secretary. The committee and Ms. Kaefer also discussed various possible approaches to visual images to be included in the report. Dr. Forman endorsed the idea of a logo that would carry through the report and into the interagency panel proposed by the RP subcommittee. Ms. Kaefer reminded members that the report would largely exist in electronic form, with the requirement that it meet government requirements for accessibility by people with disabilities, which would present challenges for tables and charts, especially. Dr. Winn also reminded members that Ms. Brown-Huamani would need to receive her instructions from committee federal liaisons, not individual committee members. Dr. Forman asked Dr. Winn and Ms. Kaefer to prepare a document for committee members detailing some of the guidelines they had mentioned. Ms. Brown-Huamani asked committee members to go ahead and submit references for the report, as SCG is compiling a database of references. Dr. Forman cautioned that the document is in danger of being top-heavy with too many references, and suggested assembling them all in a supplement. Dr. Gould suggested that supplemental materials not be printed, but be available in electronic form only.

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Ms. Brown-Huamani asked the committee to consider possible ideas for stories, vignettes, or sidebars to be included in the report, particularly ones that would help explicate the science to a lay audience. The committee discussed the inclusion of stories, and ultimately decided it would be a good idea, agreeing that different voices should be captured, and that the stories themselves should be understandable and not ponderous. The committee brainstormed many ideas for specific sidebars, including:

- Corporate leaders
- Academia/scientists (intramural and extramural)
 - Scientist with exciting finding
 - Why not made much progress to date
 - Joy of discovery
 - BCERP model
 - Scientist with new way of measuring environmental exposure
 - NCI intramural PI studying breast cancer and brain metastasis
- Media person (such as Robin Roberts, a breast cancer survivor)
- Families (maybe a farm wife with children from the Agricultural Health Study of the Migrant Farmer Study)
- Breast cancer survivor (Woman or man)
- Non-profits (role of, need, relationship to federal funding)
- Clinicians
- Interagency cooperation (Models we want to copy (DOD approach))

Dr. Collman suggested that the individual communications offices may be able to help customize the report. If their institution wishes for a more traditional report, they could incorporate some of the more creative ideas perhaps through a website. She reminded the committee of the challenge of getting the report cleared by the various agencies, and that the inclusion of creative elements could derail the process if the agencies take a dim view of the ideas. Dr. Haslam said she thought there was to be no censorship of the report. Dr. Collman said there was in fact no censorship of what is being written, simply concerns about the format, and a desire to see the report harmonized among the agencies and accepted in the end. Ms. Canin asked Dr. Collman to be fully cognizant of the reasons the committee might have had for approaching format in a particular way and ready to defend it in case of resistance by any of the agencies. Dr. Collman said she was willing to do so, but was attempting to make the committee aware of the potential for significant delays if an agency or agencies should reject the report based on some of the formatting. Ms. Kaefer mentioned that discussion with the NCI Office of Communications suggested that consultation regarding clearance of formatting elements should take place early in the process, rather than waiting to final submission of the report for clearance, allowing for feedback along the way. Dr. Forman asked her to delineate the best process for doing that.

Dr. Gould suggested that remarks from IC directors praising interagency work be included.

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Dr. Collman noted the long list of sidebar story ideas, and cautioned that they could not all be included given the length of the report. Dr. Forman asked the committee to agree before the end of the meeting on the number of chapters, and whether or not sidebars or vignettes would be included, so that the format of the report could start going through the pre-approval processes that had been described.

Following considerable discussion, the committee arrived at a tentative timeline for completion and roll-out of the report:

Timeline

October/November, 2011: IBCERCC report done.

October/November, 2011: NIEHS and NCI engage Komen, etc. Let them know our timeline. Let them know that we want to show that these are two important reports. Update them on our status. Discuss where we can work together.

December/January, 2011: Fixing little details, communication plan fully developed and ready to go.

December 5-7, 2011: San Antonio Breast Cancer meeting. IOM report embargoed until then... 10,000 foot level. Bob Hiatt and Irva Hertz-Picciotto give the report overview. Then symposium on breast cancer and environment (not specifically linked to report). Komen at the meeting. Komen notes that IBCERCC is coming in the future. Add language to NIEHS and NCI websites about what the IOM report found.

December 7-18, 2011: Committee members review IOM report and incorporate recommendations.

December 15, 2011: IBCERCC committee teleconference to discuss IOM findings. Subcommittees add language that addresses IOM issues in the IBCERCC report.

January 23-24, 2012: In-person committee meeting at NIEHS.

January 31, 2012: Report finalized.

February 1-?, 2012: Institute (NCI and NIEHS) clearance.

February ?, 2012: NIH level clearance.

March 1, 2012: Send to HHS Secretary. She sends to other agencies as needed.

April 15, 2012: Official roll-out of IBCERCC report.

There was also discussion about Dr. Birnbaum's proposal that an article appear in *Environmental Health Perspectives* describing the tasks involved in both the IBCERCC report and the IOM

report prior to their release. Then, following their release, another article would come out describing the reports' contents. Dr. Walker commented that it would appear that the time has passed for the first article to be prepared, and urged that the appropriate steps be taken to reserve space in the journal for the second article. She felt that Dr. Forman and Dr. Hertz-Picciotto could co-author the article, representing their respective committees. Dr. Collman pointed out that the co-authoring scenario would necessitate delay in writing the article until after the Secretary has approved the IBCERCC report, which would delay the article's publication, and thus perhaps reduce its impact. She noted that if the IBCERCC were the sole authors, work on the article could begin immediately following release of the IOM report, thus preserving the impact of the article by timing it more closely with the release of the IBCERCC report.

Per Dr. Haslam's request, the committee reviewed the stated task for the IOM report, and discussed the distinctions between it and the IBCERCC tasks. Dr. Walker pointed out that the two reports are "completely complementary."

Anticipating the next session, Dr. Forman asked the subcommittees to prepare up to three major points for discussion.

IX. Public Comment

Dr. Forman asked whether there were any public comments. There being none, she called the public comment period to a close.

X. Subcommittee Report Back

Dr. Forman asked each of the subcommittees to report back to the full committee regarding their major points for the Executive Summary.

Dr. Ellison from NCI presented the major bullet points from the SoS subcommittee:

- In order to eradicate breast cancer we need to identify causes and strategies for prevention. Many of the known risk factors are not modifiable, yet environmental factors are modifiable.
- Despite extensive work on breast cancer, there are few conclusive risk factors. This could be due to:
 - Assessment of exposure during inappropriate life stages
 - Lack of consideration of potential etiologic pathways for breast cancer subtypes and lack of awareness of agents or mixtures/combinations of agents to assess
 - Personal susceptibility factors:
 - Ethnic, genetic and phenotypic variations
- Not all populations are as equally susceptible to the effects of environmental exposures
- Among the advances in breast cancer prevention, diagnosis, and treatment, there are few environmental factors that have been among the advances identified.
- Which, When, Who, How much evidence is needed for action?

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- The goal of the report is to foster or define a research process that frames the future strategies for breast cancer & environment focused on filling gaps, fostering innovation and maximizing accountability across Federal agencies.
 - Expand the role of advocates such that they are integrated from the inception of research programs through dissemination.
 - Training the next generation of scientists in the field of breast cancer & environment

Dr. Portier presented the results of the deliberations by the RP subcommittee. Their recommendations included:

- Need for a consistent way of communicating to the public the current state of the evidence and why research needs to go in a specific direction.
- Create and utilize a “framework” for BC & E research which is a
 - Landscape of scientific opportunities, resources and gaps.
 - A tool for assessing our understanding of the current state of the knowledge and for identifying research needs.
 - The bulk of research funding in this area.
- Rapid deployment
 - Ability to explore new ideas that emerge from framework-directed research.
 - Rapid follow-up on good ideas.
- Support “outside the framework” thinking
 - Support individuals with funds to apply to questions within BC & E.
- Create a BC & E Interagency Coordinating Committee as a standing committee charged with:
 - Creating a strategic plan to effectively move forward with BC & E research.
 - Empowered to fund BC & E across multiple agencies.
 - Coordinating BC & E research with non-profit and other entities currently funding BC research (a public/private partnership).
 - Creating and maintaining the recommended “framework” for BC & E, and to use this tool in identifying priority research needs.
 - Establishing regular and evidence-based communication of current evidence of BC & E to the public. A voice to communicate to the public on readiness for public action on an environmental factor.
- Increase integration of consumer advocates in the research process.
 - Recommend advocate involvement in every level of research but not an unfunded mandate.
 - An advocate is defined as?? “a representative of an organization or formal part of the stakeholder community” “may need to be educated to be effective in this role” “an advocate who knows something about science.”

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- Role they should play or can play - programmatic decisions? reviews? examining programmatic impact? (good example: DoD program).
 - Dual roles possible – i) oversight and decision making, and ii) in individual research programs.
- Dealing with the state of evidence is important.
- Develop funding models that bring together people with different perspectives to examine BC & E issues.
- Trans-disciplinary research.
- Innovation
 - Not being promoted with the status quo (review process).
 - What weight should be given in the portfolio?
 - Allowing some research to move forward faster than might normally occur – rapid deployment.
 - Formative research (pilot projects) grants. Works for NIEHS Centers – Not an innovative idea but supports innovative research.
 - Who is the gatekeeper? Program officer, study section, a panel, Need for a funding mechanism that specifically recognizes
 - Funds for potentially innovative individuals (Hughes model), for problems intractable within current funding models, or for examining.

Discussion

Dr. Zahm wanted to be sure that in addition to data sharing the issue of biospecimen sharing was included—i.e., banking some small portion of collected samples so that they are made available to other researchers. Dr. Portier noted that the group had neglected to include a mention of data sharing, and would be sure to include both.

Dr. Zahm questioned whether it would be appropriate to consider the proposed interagency coordinating committee the front line of communication of the science, and urged caution in defining the committee's role in communication activities. Dr. Gould said this had been the subject of much debate in the subcommittee, particularly the issue of what weight of evidence was necessary before something should be communicated. Dr. Zahm said that ways of communicating across the spectrum should be developed, from various weights of evidence, cautioning against a paternalistic mindset. Ms. Rizzo said the question here was the scope of the problem, and how much one committee could protect society against the many risks involved. She noted that by having a communications strategy during the research, the researcher is better prepared and able to have a voice upon its release. Considerable discussion ensued about these points, with the consensus emerging that the communication effort should facilitate the flow of information without filtering the content unnecessarily.

Dr. Engel presented the major points from the RTDPI subcommittee. First, she shared a “big-picture reminder” from the subcommittee, a theme running throughout its bullets:

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The over-arching panel to support research and communication around breast cancer and environment must be committed to innovation, creativity, adaptability, inclusivity, public health precaution, and prevention of breast cancer.

She then presented the subcommittee's bullets (the following list reflects changes made during the subsequent discussion period).

- 1) Strategic expansion of environmental monitoring and biological monitoring across the life course, population subgroups, etc., to facilitate research on breast cancer and the environment.
- 2) Prioritizing chemicals to undergo testing should take into account cellular and molecular methods (e.g., activity at hormone receptors), tissue changes (e.g., altered mammary gland development), and susceptibility factors (e.g., early puberty), and community concerns unique to geographical, occupational, or other environmental exposures.
- 3) We recommend agencies include research translation and communication activities in RFPs/provide for research translation (plan could bring in expert communicators, advocates, etc.) [RTDPI needs to re-write this recommendation – researchers are accountable to provide findings in a timely fashion but need collaborative process to bring findings to public (via MMWR model?), not a one-size-fits-all]; NIEHS research to action plan
 - a. This process must include advocates at the outset from diverse socioeconomic, cultural and linguistic groups to attain the best possible outreach to all stakeholders and constituents.
 - b. **need a balance so that researcher includes a research translation plan in grant applications; agencies are aware of that plan ... when funded, make agreements to communicate annually, etc. Include metrics for assessing translation efficacy; funding for translation.
- 4) An inter-agency collaborative committee should be formed to address the need for ongoing efforts to summarize, contextualize and communicate the body of research from toxicology, epidemiology and other disciplines as it relates to breast cancer and the environment. The data gathered through this process would support
 - a. Data sharing that provides easy access to the latest information
 - b. Better coordination and expedition of processes for regulation
 - c. Effective infrastructure to translate, communicate and disseminate research findings:
 - i. to all agencies with regulatory jurisdiction over areas related to breast cancer and the environment research where data might impact regulatory decisions at other agencies
 - ii. to the external network of advocates and stakeholders who have the potential to translate findings into educational/communication tools and into public health preventive actions.

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- iii. using emerging and innovative communication technologies and research to reach a wide public.
- d. An initial task of this collaborative must be translation, communication and dissemination of information in this report.

Discussion

Dr. Walker said it was very important that multiple groups were embracing the concept of the interagency panel, elevating it to a key point. She also asked the subcommittee to think carefully before requiring communication or translation plans from investigators. Ms. Rizzo pointed out that the idea was to stress the importance of there being a plan to get the science out, not necessarily dictating when and by whom. Dr. Walker said that requiring researchers to participate in activities other than the research itself slows down progress, although there are some situations where it is appropriate to ask the researcher to participate in communication and translation activities. The “requirement” terminology was the issue for Dr. Walker. The committee agreed, and this discussion is reflected in the notes appended to bullet point #3 above. Committee members felt that both the researchers and the agencies needed to be aware of and participate in communications and translation efforts, with both plans and outcome metrics included to ensure accountability, both between the investigator and the funding agency, and the funder and the community.

Dr. Collman pointed out that there should be communications activities, not simply plans for them, which may not be carried out. Ms. Canin noted that the committee should be strong in its recommendations, and so was more comfortable with the idea of “requiring” particular activities. Dr. Walker said she was specifically uncomfortable with the (previously proposed) requirement for the PI to have a communications plan as part of the grant application. Dr. Ambrosone agreed with Dr. Walker, and felt that it would be a superfluous, empty element in most grant applications. Dr. Forman agreed, saying that still, the researcher needs to be accountable to provide the findings in a timely fashion, and the community needs to help communicate the findings to the public, perhaps in a newsletter approach. Dr. Collman expressed concern that the committee was searching for a “one size fits all” model, when there may be different valid approaches depending on the situation. She felt that the recommendation should be modified and rewritten to reflect the different potential approaches. The committee agreed that this was an area that needed more thought and work.

XI. Adjournment

Ms. Rizzo thanked Dr. Forman for her work in chairing the committee and the meeting, and the staff members who had contributed their efforts.

Dr. Forman thanked the committee for its work, and adjourned the meeting at 3:00 pm September 27, 2001.

CERTIFICATION

I hereby certify that, to the best of my knowledge, the foregoing minutes are accurate and complete.

/Michele Forman/

Michele Forman, PhD

Chairperson

Interagency Breast Cancer & Environmental Research Coordinating Committee

/Gwen W. Collman/

Gwen W. Collman, PhD

Executive Secretary

Research Process Subcommittee

Interagency Breast Cancer & Environmental Research Coordinating Committee

Proper signatures

Treat as signed, § 1.4(d)(2)